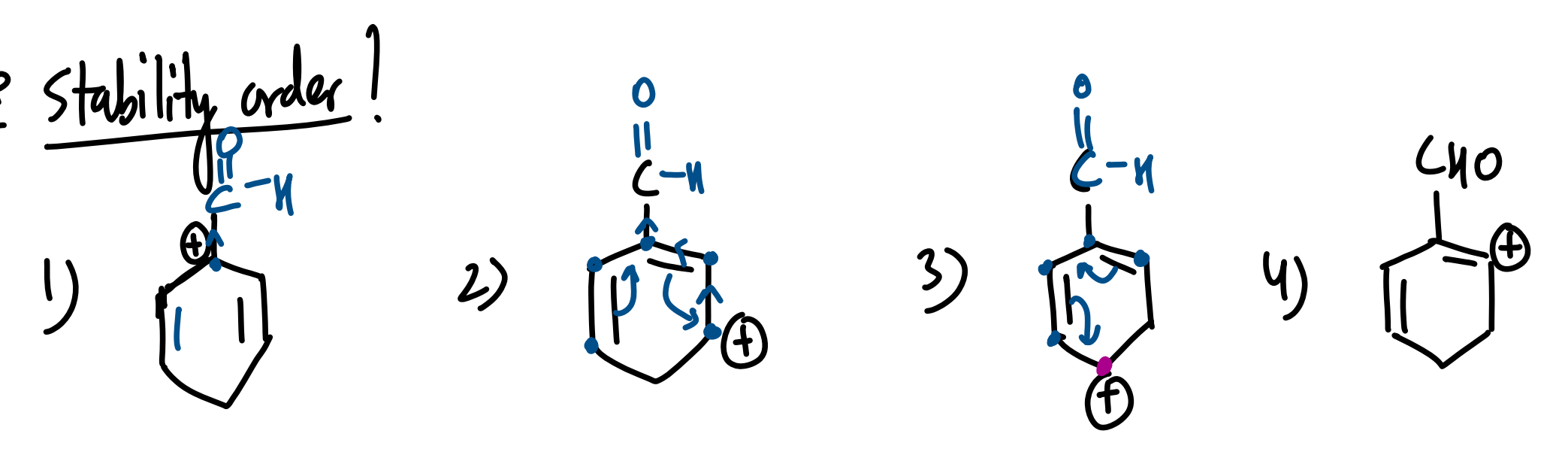
# Organic file 1 jan 13

Friday, 13 January 2023 17:57

Q. Stability order !



$\boxed{3 > 2 > 1 > 4}$

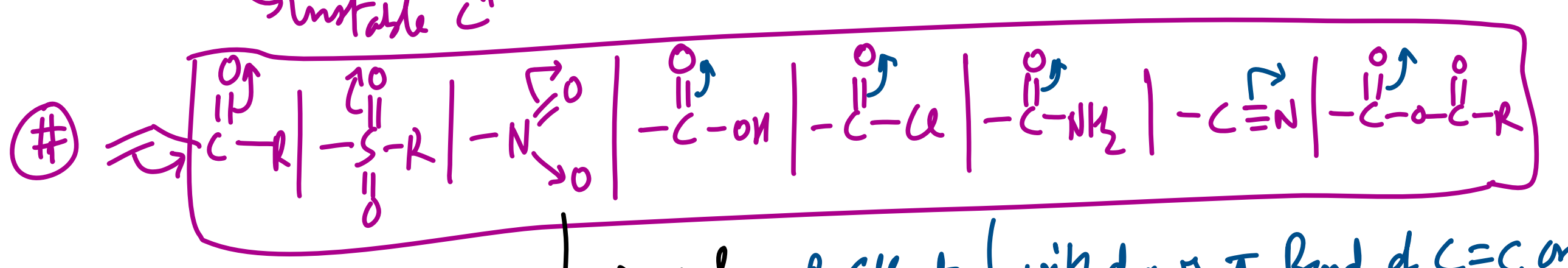
$\boxed{\overset{+}{C}-C=C}$ → stable

$\overset{+}{C}-C=O$ | N=O | S=O | C≡N

δ+ repl^n

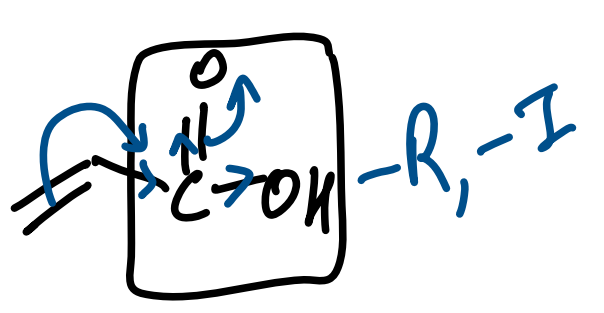
→ unstable $C^+$

-R > +I

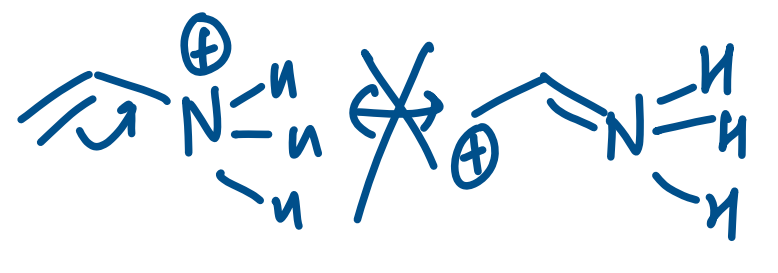


# $-\overset{O}{\overset{\|}{C}}-R$ | $-\overset{O}{\overset{\|}{\underset{\|}{\underset{O}{S}}}}-R$ | $-NO_2$ | $-\overset{O}{\overset{\|}{C}}-OH$ | $-\overset{O}{\overset{\|}{C}}-Cl$ | $-\overset{O}{\overset{\|}{C}}-NH_2$ | $-C\equiv N$ | $-\overset{O}{\overset{\|}{C}}-O-\overset{O}{\overset{\|}{C}}-R$

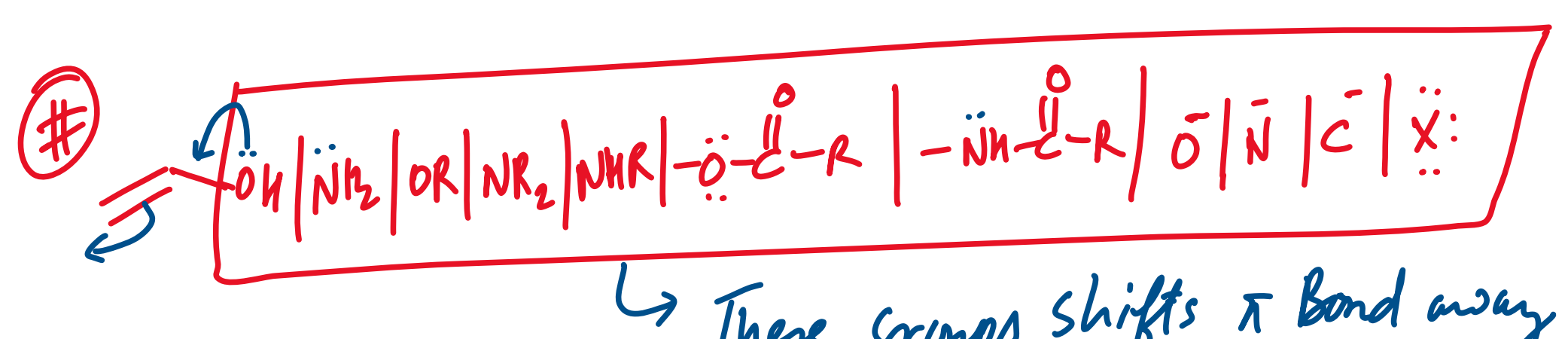
→ -I & -R effect (withdraws π Bond of C=C or C≡C towards themselves)
or -M



-R, -I



(N cannot form 5 Bonds)
so $-\overset{\oplus}{N}H_3$ or $-\overset{\oplus}{N}R_3$ only show -I effect



# $-\ddot{O}H$ | $\ddot{N}H_2$ | OR | $NR_2$ | NHR | $-\ddot{O}-\overset{O}{\overset{\|}{C}}-R$ | $-\ddot{N}H-\overset{O}{\overset{\|}{C}}-R$ | $\bar{O}$ | $\bar{N}$ | $\bar{C}$ | $\ddot{X}:$

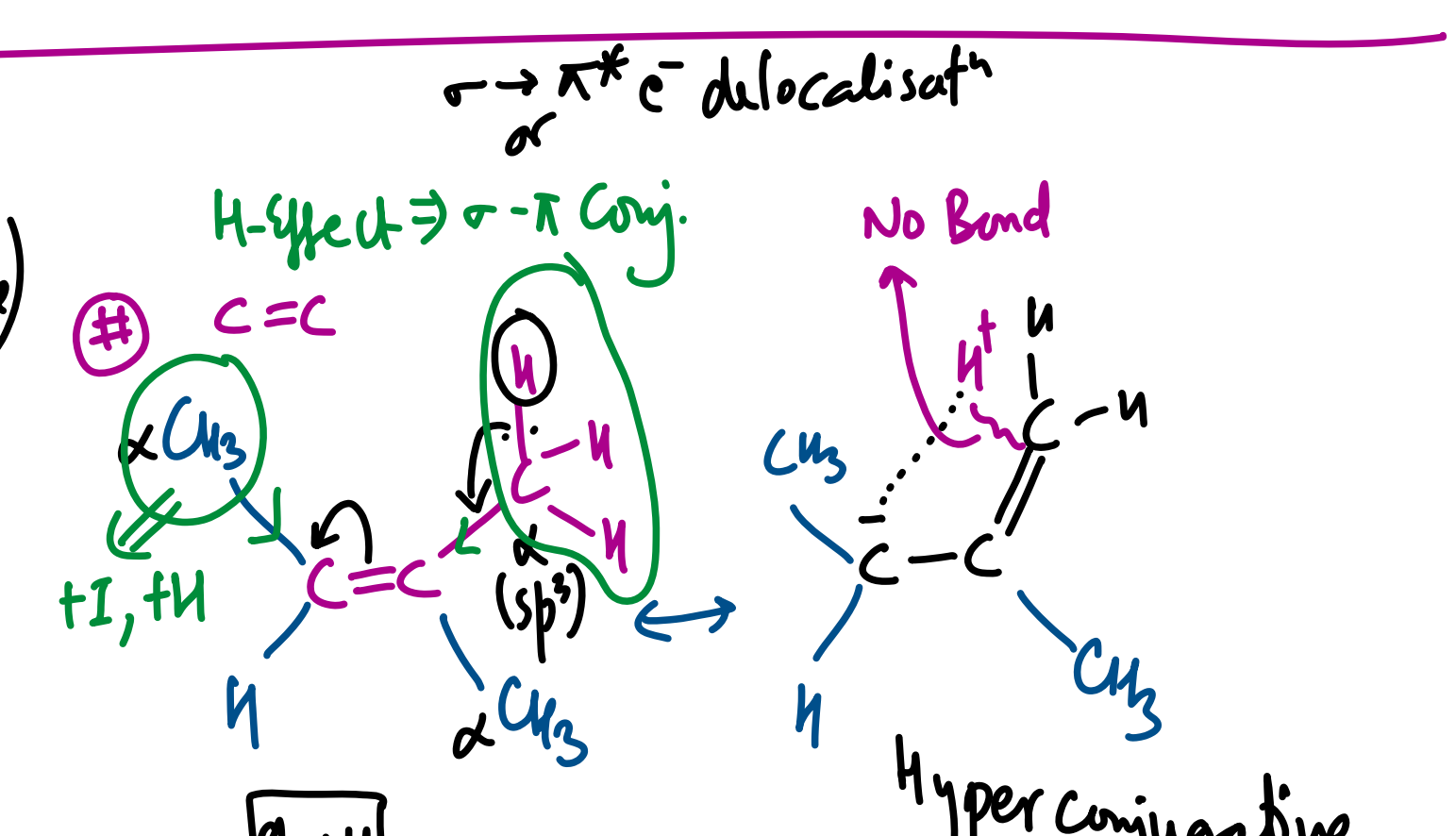
↳ These groups shifts π Bond away from them
So they have donating effect via M-effect or R-effect
& called $\boxed{\text{+R or +M showing Group}}$

---

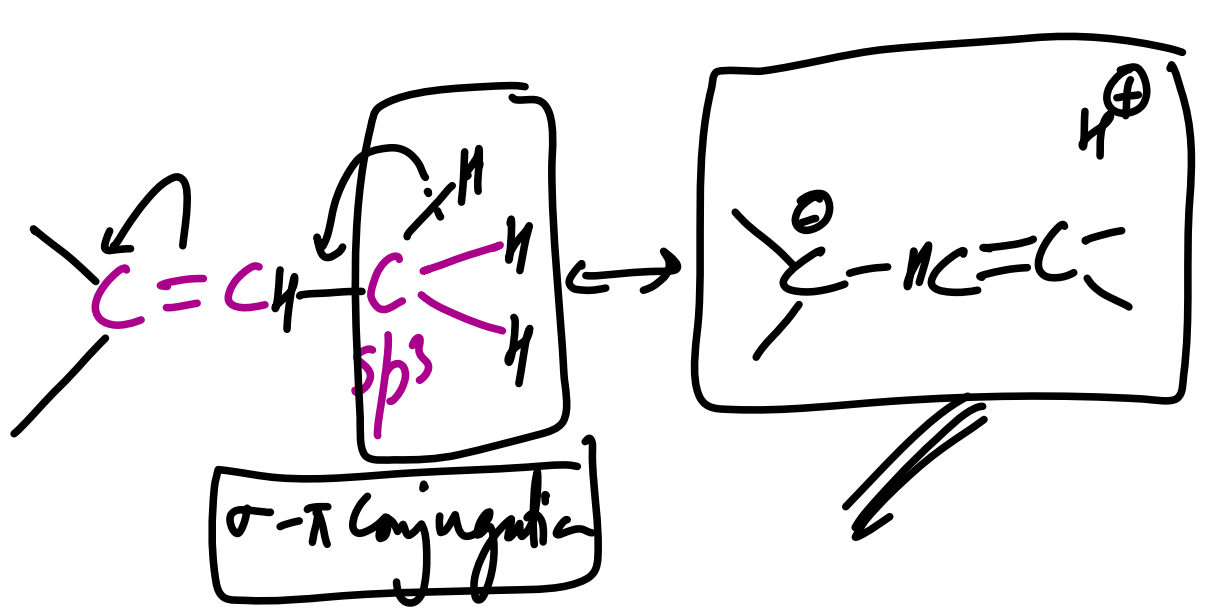
Hyperconjugation (H-effect) (Baker-Nathan Effect, No-Bond Resonance)

- Applicable for C=C, $\overset{+}{C}$, $\dot{C}$
- $\boxed{\sigma\ e^- \text{ are involved}}$

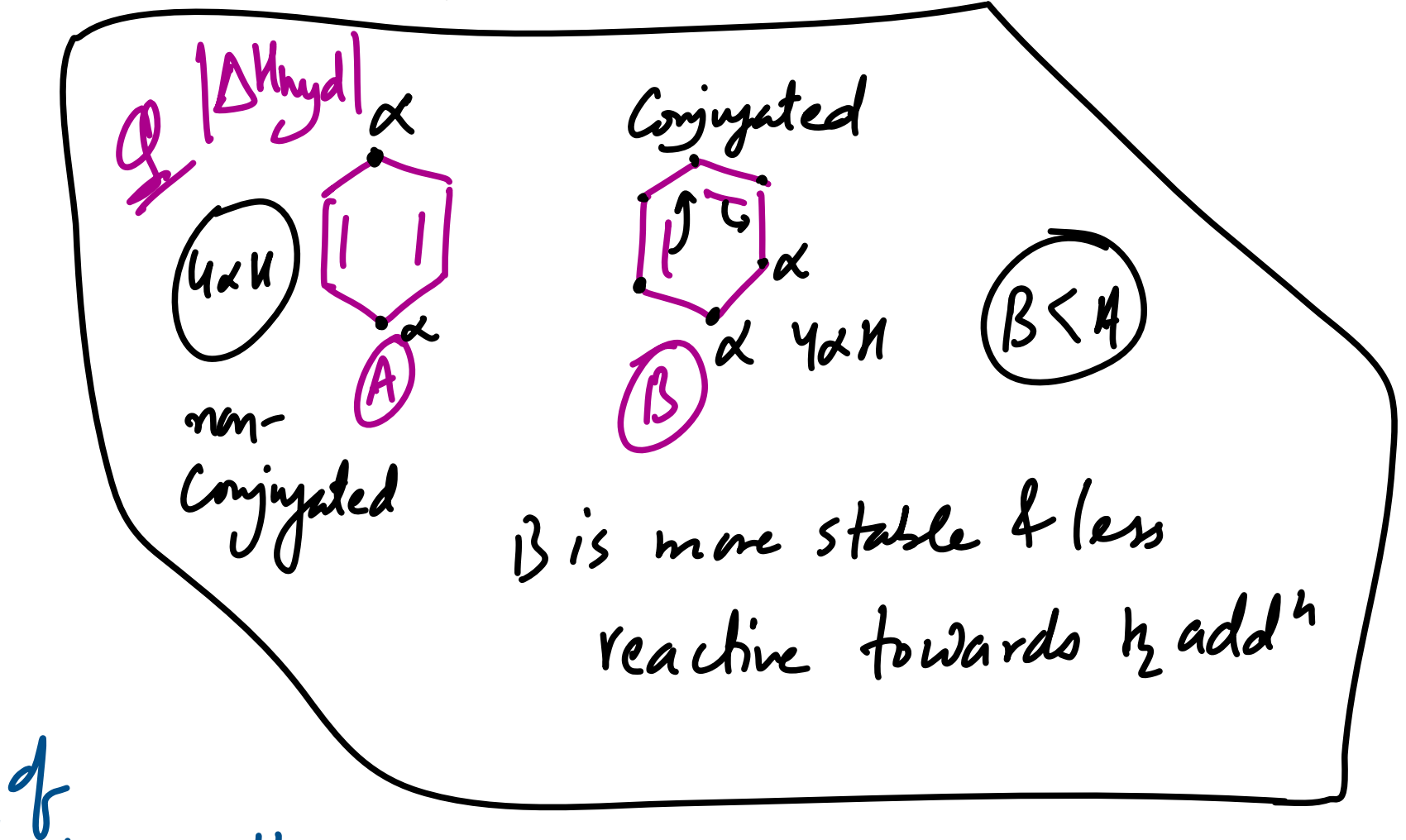
H-effect ⇒ σ-π Conj.
or
σ → π* $e^-$ delocalisat^n



Total H-structure = No. of α-H



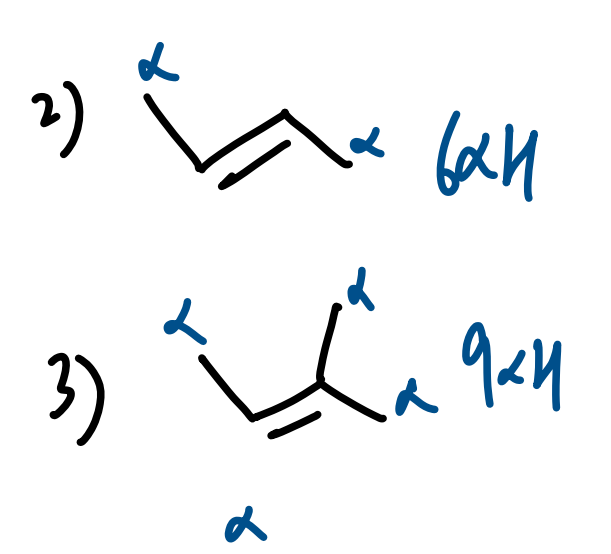
σ-π Conjugation
or
σ → π* $e^-$ delocalisat^n



B is more stable & less reactive towards $H_2$ add^n

Q. |ΔHhyd| order

1) $C_2H_4$ → least stable, more Reactive |ΔHhyd| → max



$\boxed{1 > 2 > 3 > 4}$

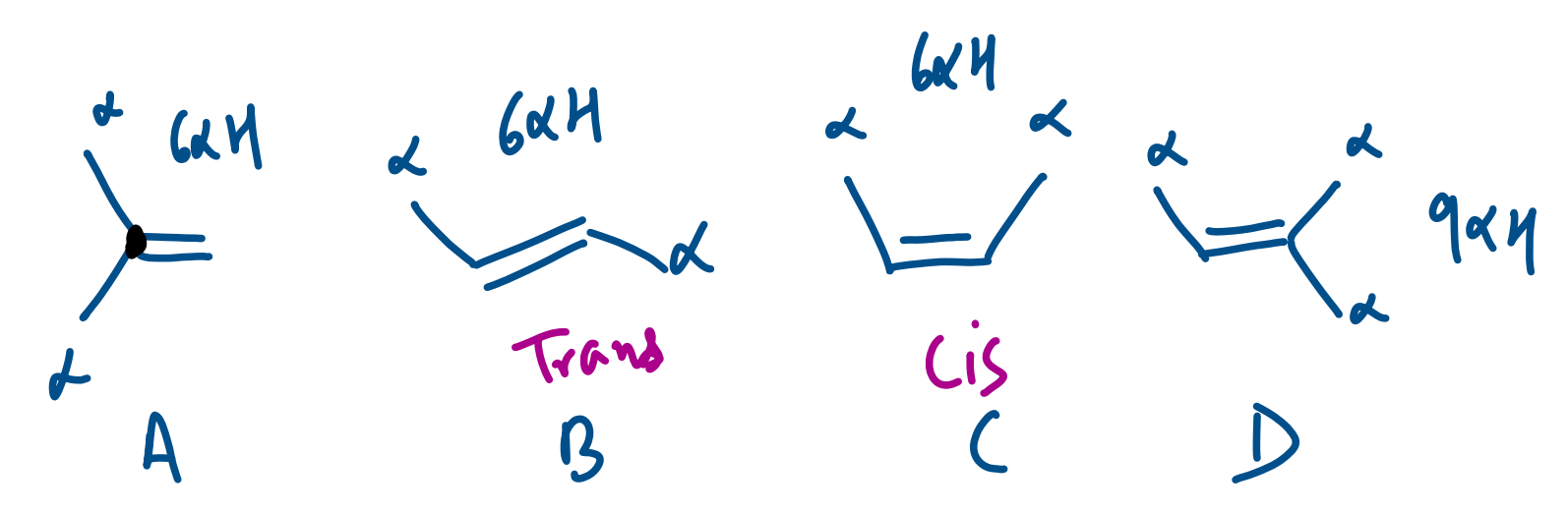
more α-H, more stable C=C w.r.t
Heat and Hydrogenation (add^n of $H_2$)

⊛ $C=C + H_2 \xrightarrow[R_x^n]{add^n} \underset{H\ \ H}{C-C}$ ; $\Delta H_{hydrogenat^n} = -ve$ → Enthalpy of hydrogenat^n

⊛ more -ve $\Delta H_{hyd}$, more reactive is alkene

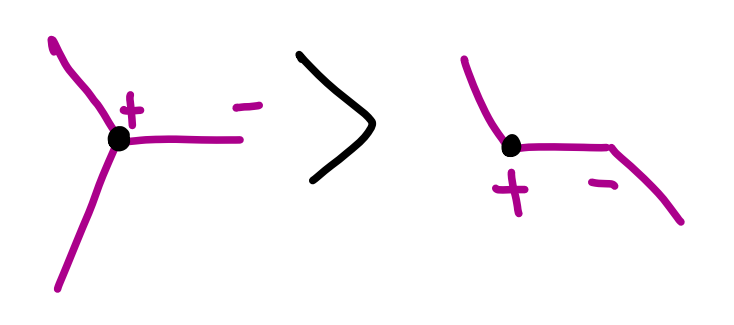
⊛ $\boxed{\text{Stability of alkene} \propto \dfrac{1}{|\Delta H_{hydrogenation}|}}$

Q. Stability order :-



When α-H is same, then Check stability by Charge seperation.

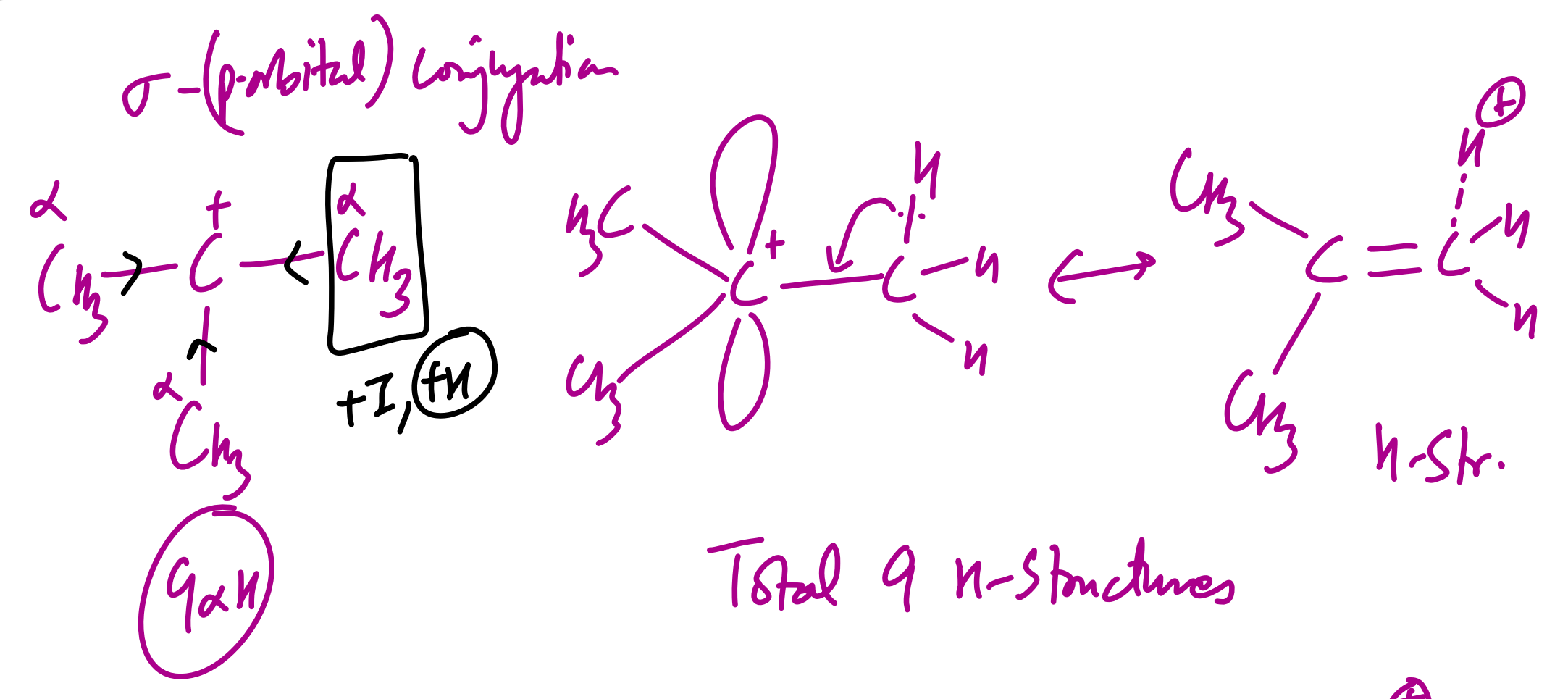
Stable



$\boxed{D > A > B > C}$

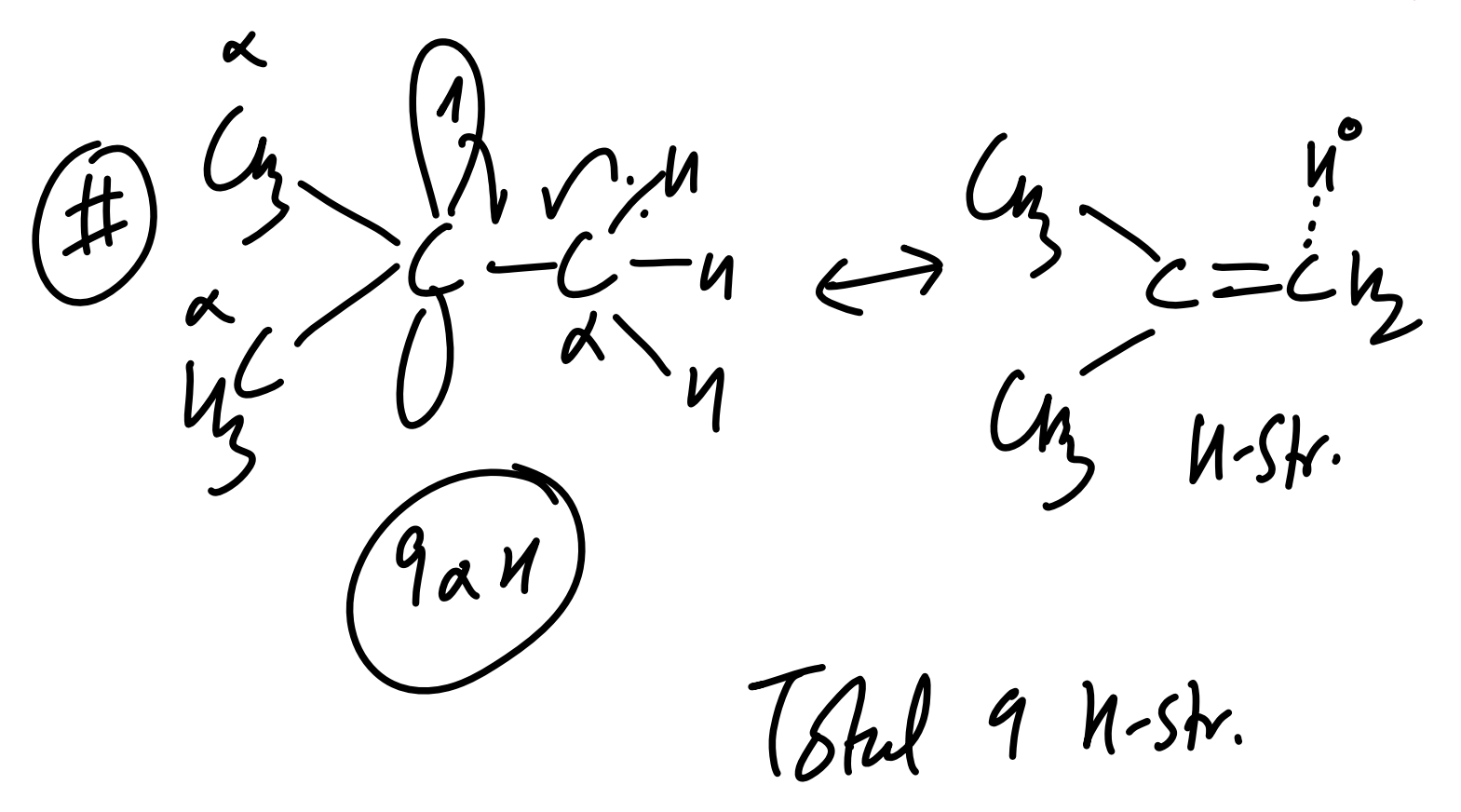
---

# σ-(p-orbital) conjugation



Total 9 H-Structures

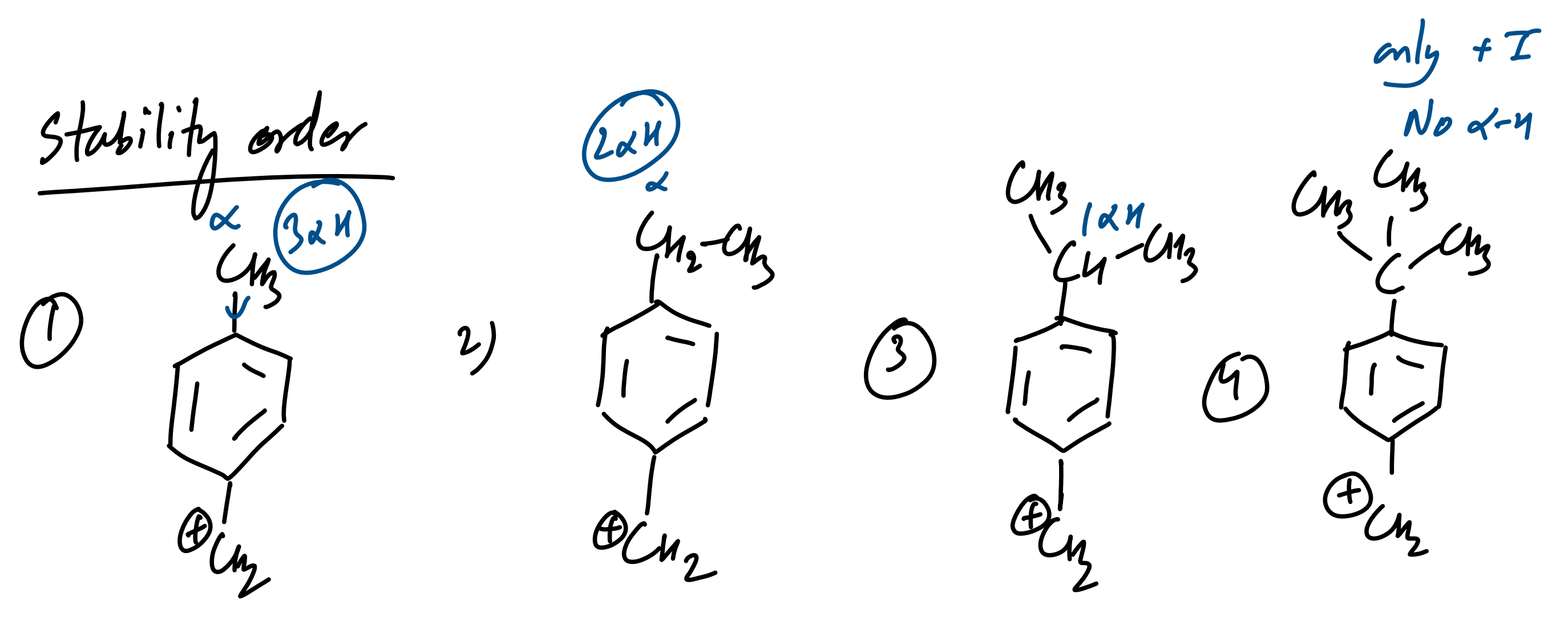
more α-H, more stable $C^{\oplus}$



Total 9 H-Str.

More α-H, more stable carbon free Radical.

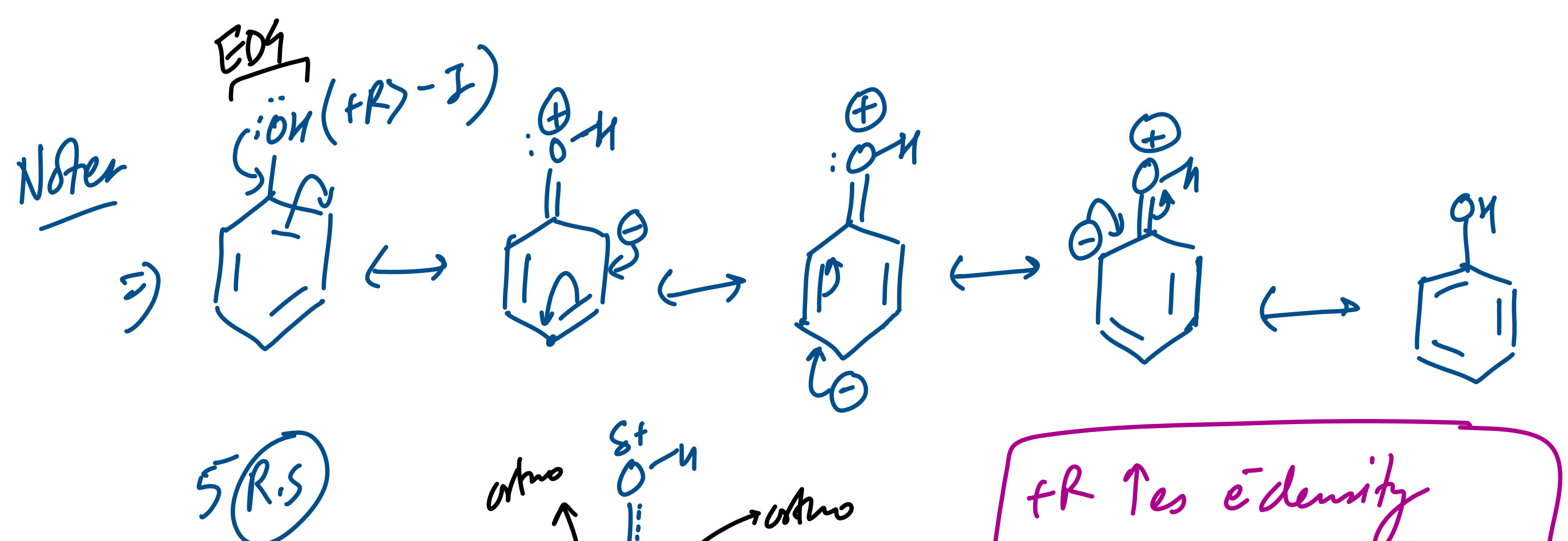
Q. Stability order



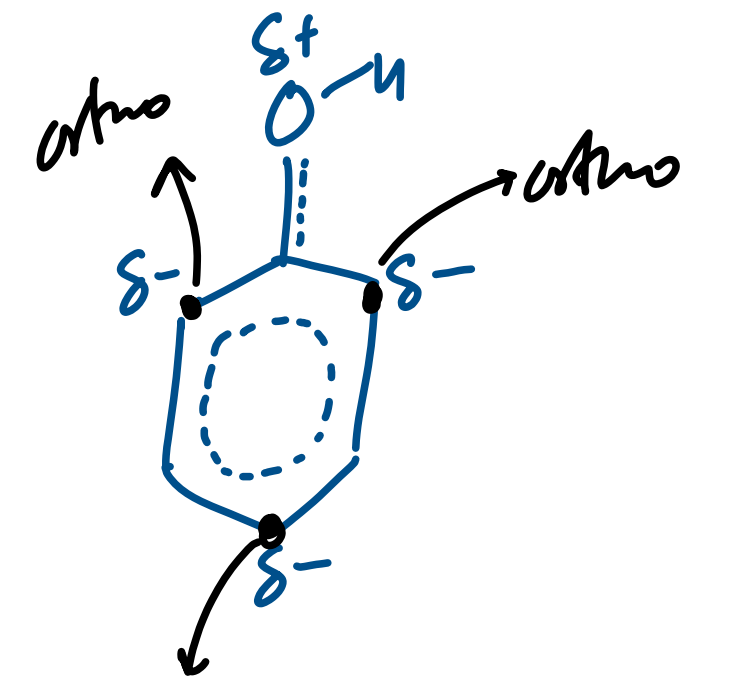
$\boxed{1 > 2 > 3 > 4}$

Notes

EDG :ÖH (+R > -I)

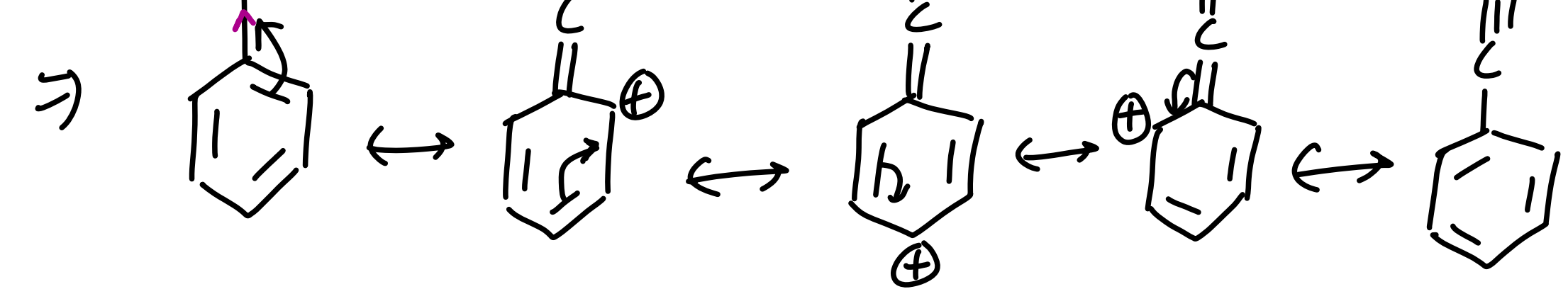


5 R.S

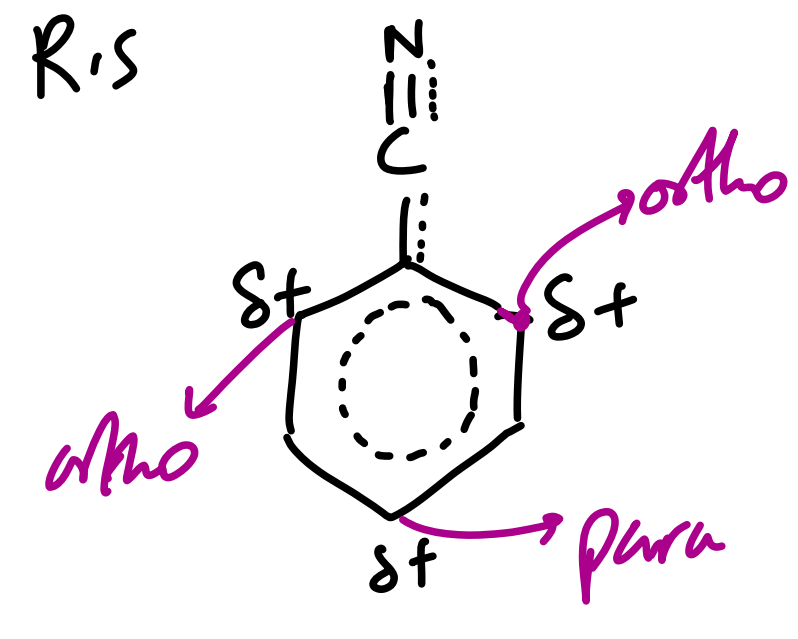


$\boxed{\text{+R ↑es } e^- \text{ density on ortho / para position only}}$

EWG [ -R, -I



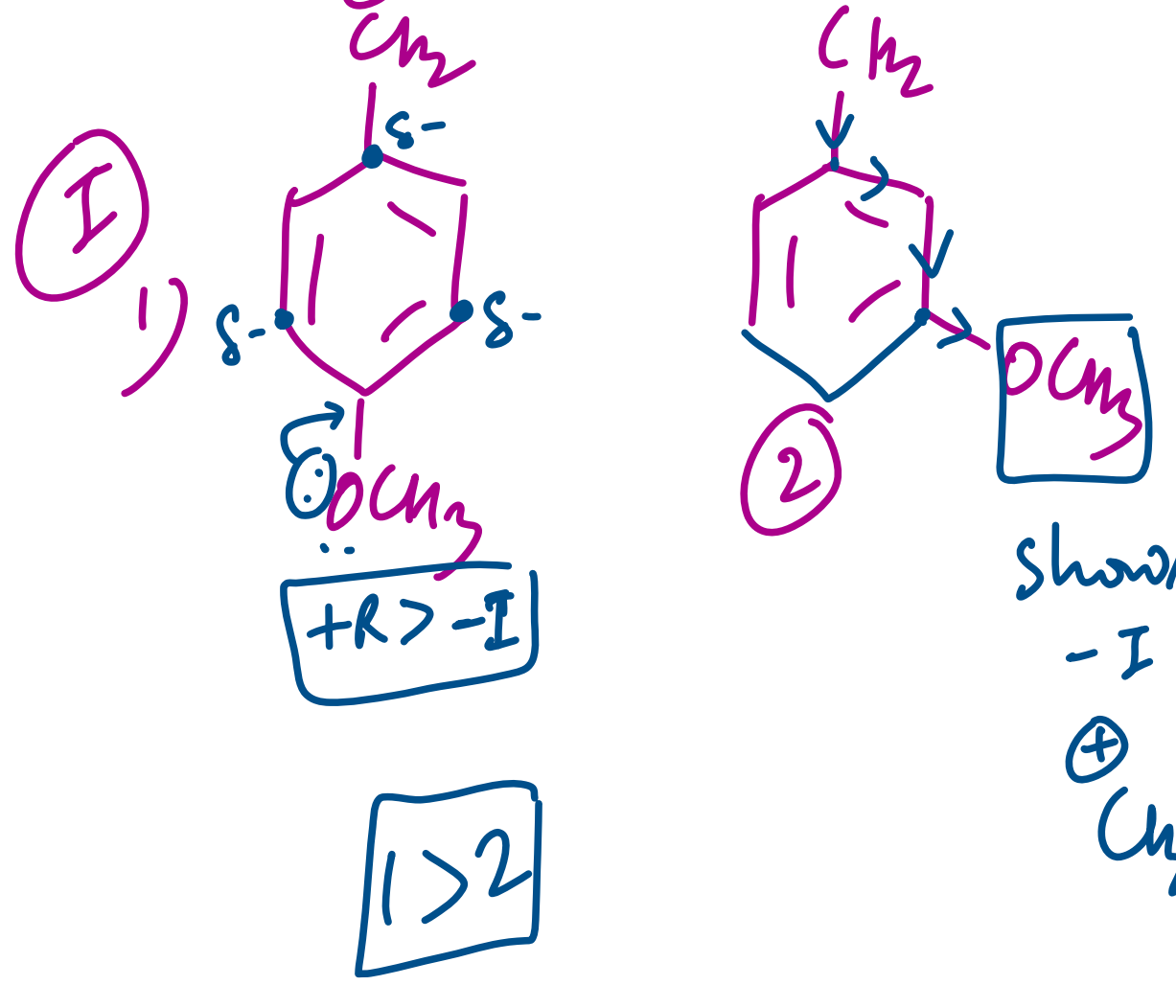
5 R.S



$\boxed{\text{-R effect ↑es δ+ on ortho & para position}}$

$\boxed{\text{Similarly +H effect ↑es } e^- \text{ density at ortho / para location}}$

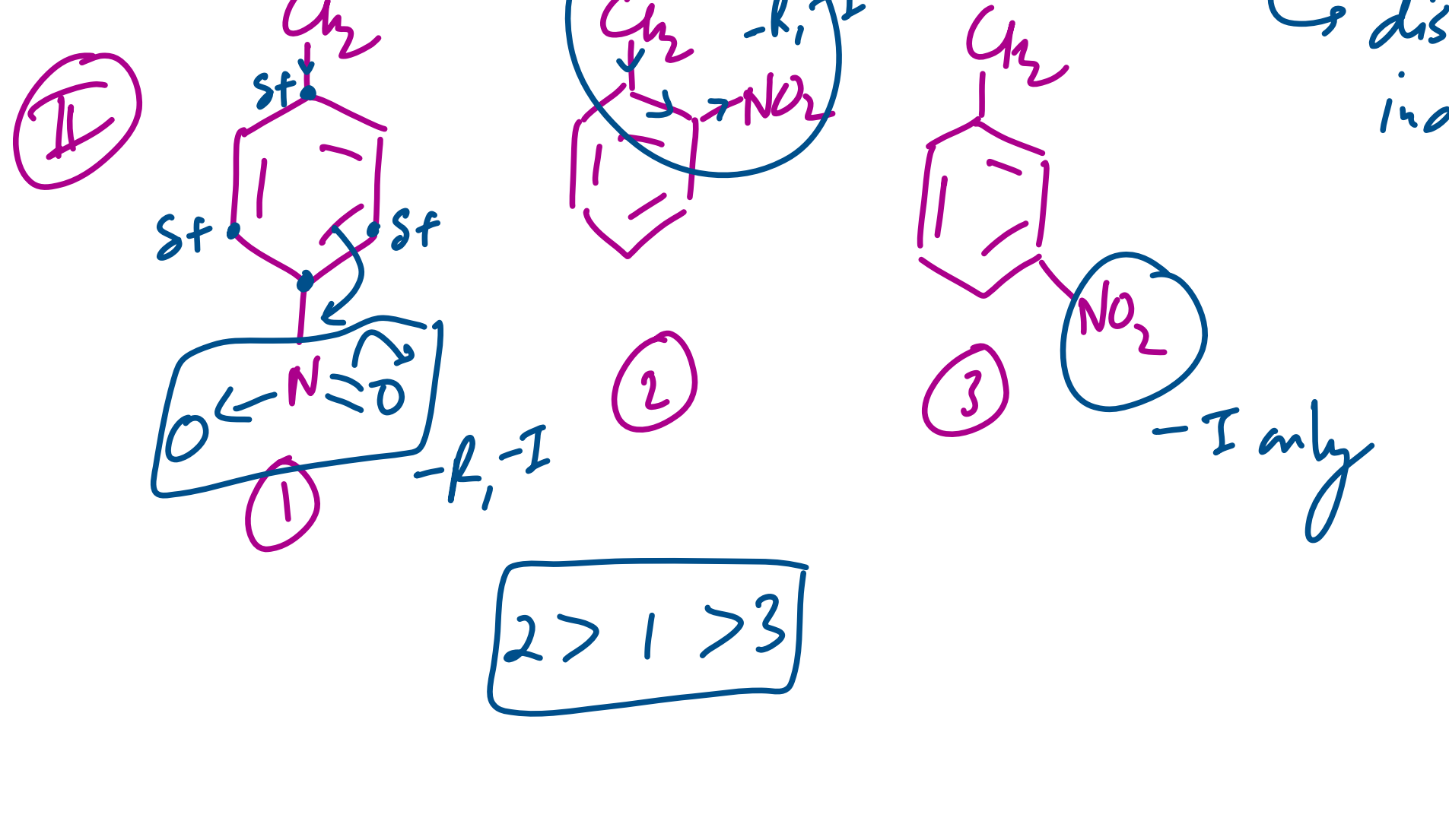
Q. Stability



+R > -I

shows only -I w.r.t $\overset{\oplus}{C}H_2$

$\boxed{1 > 2}$



-R, -I

-R, -I

-I only

$\boxed{2 > 1 > 3}$

$\boxed{\text{Resonance \& H-effect}}$ → distance independent